World Health Organization

3nd MEETING OF THE SAGE WORKING GROUP ON INFLUENZA VACCINES AND IMMUNIZATION (SAGE WG)
31 August - 1 September 2011
WHO Geneva, Salle M105

1. Welcome and opening remarks:

Joachim Hombach welcomed meeting participants and introduced the WHO secretariat to the SAGE Working Group on Influenza Vaccines and Immunization (WG). John Tam was the WG focal point from the secretariat. Elizabeth Miller, the chair, welcomed everyone to the third meeting of the WG, and outlined the agenda to be covered over the next two days.

2. Objectives of the 3rd meeting

- To further review evidence to support updating the position paper on influenza vaccine for the 5 target groups in the conceptual matrix stratified
- To review the results of a systematic review on vaccine effectiveness in LMI countries
- To review the burden of influenza in children under 2 years of age
- To formulate draft recommendations for SAGE for each of the 5 target groups
- To further consider the options for the WHO pandemic H5N1 vaccine stockpile
- Other influenza vaccines related matters

3. Vaccine effectiveness (VE) in HIC and LMIC in different target groups

The WG discussed the different factors that should be considered when measuring and comparing results of influenza VE. Optimal model of VE measurement included:

- Influenza-specific outcomes based on virological and/or RT-PCR detection (outcomes measures)
- RCTs when available or otherwise,
- Well designed observational studies that account for confounding elements with sufficient statistical analysis on conclusions (study design)
- Studies over multiple seasons and studies with vaccine match analysis.

VE in high income countries (HIC) based on RCTs showed adequate levels of vaccine effectiveness in different target groups. VE varies greatly among studies in children less than 2 years and the in the elderly. Little data were available for vaccination of health care workers and impact on protection of patient in a systematic literature review.

A systematic literature review on vaccine effectiveness in LMIC showed limited VE for different vaccinated population groups per influenza-specific outcomes. All were performed in middle income countries (MIC) and the majority was from urban areas. Studies showed that in MIC, seasonal vaccine was effective for most influenza outcomes. Highest level of evidence for effectiveness identified for:

- respiratory and influenza illness, and laboratory confirmed influenza in children (effectiveness is lower as compared to HIC)
- influenza-like illness (ILI) in elderly and in working adults (effectiveness is higher in LMIC as compared to HIC).

Summary of discussion

The WG commented that meta-analysis of influenza VE should be considered with caution as they may account for important confounding indicators such as variability by region, vaccine types, disease endpoints, vaccine strains matching to circulating viruses and vaccination coverage of targeted groups as well as the variety of clinical profiles of the products under study.

The WG also noted that VE studies should also take into account other particular risk factors and vaccine strain match to circulating viruses, Countries may not know what vaccine formulation (northern vs. southern) they should be using and would need special recommendations for the development of country-specific immunization policy. Especially for tropical countries where influenza seasons are not well defined or influenza epidemics occur all year round.

For Recommendations:

- Meta-analysis vs RCT: Evidence to support recommendations should be based primarily on findings deriving from RCTs with laboratory confirmed endpoints, supplemented where necessary by RCTs with less specific disease endpoints such as all cause acute respiratory illness and high quality observational studies with laboratory confirmed endpoints. These points should be mentioned in the position paper.
- Tropical countries vs. temperate countries: Vaccination parameters (timing, procedure etc.) should be specified for countries with different climatic conditions and supported by epidemiological evidence.
- Evidence on VE in all risk groups should be graded.
- HIC and LMIC may be considered as one group for VE analysis. Vaccine impact is expected to be different in LMIC, in particular due to the limited data demonstrating higher burden of disease and differences in health-care provision.
- More information on disease burden and vaccine performance such as effectiveness and impact are needed from LMIC, especially Sub-Saharan Africa.
- Generic recommendations about influenza vaccines usage should be provided. LAIV may need to be addressed specifically as well as adjuvanted vaccines. In relation to evidence and grading, these would need to be separated out as vaccine-class specific.
- Recommendations should be made with consideration on the contribution of influenza to the total clinical spectrum of diseases (e.g. total burden of mortality, hospitalization, pneumonia etc.)

4. Vaccine economic evaluation (cost-effectiveness (CE), cost-utility, cost benefit) in LMIC

Review of two model-based economic evaluations documented CE of seasonal influenza vaccination for elderly and high-risk children in MIC (e.g. South America) and confirmed consistency of findings with outcomes reported for HIC. Results of RCT-based economic evaluations should be interpreted with caution.

Summary of discussion

The WG agreed on the rising importance of CE analysis in vaccine policy development. The WG also agreed that CE is important in the context of technology transfer for vaccine production in LMIC that will result in price reduction. At the same time needs and production capacities should be assessed as many LMIC still report low uptakes of seasonal influenza vaccines.

For Recommendations:

- Positions papers should refer to cost-effectiveness (typically cost-utility) data as a country-specific element for decision making due to differences in health care settings
- Economic analysis is an important factor to be considered in vaccine policy development
- More evidence on CE is needed, especially from LMIC

5. Review of seasonal and pandemic vaccines safety

The main items addressed in this section were:

- Guidance on nonclinical and preclinical evaluation of adjuvanted vaccines
- Updated statement by GACVS on Pandemrix and Narcolepsy
- Activities by GACVS on maternal immunization.

Summary of discussion

The WG noted that with a number of vaccines formulated with a range of adjuvants currently being in preclinical and clinical development or being licensed. WHO is organizing a consultation on the nonclinical and preclinical evaluation of adjuvanted vaccines and initiate drafting of a WHO guidance document for the nonclinical and preclinical evaluation of such vaccines.

The WG was also informed of the EMA's recommendations on the use of Pandemrix. GACVS concurred with the recommendations, stating that Pandemrix in persons under 20 years of age:

- may only be used if the recommended seasonal trivalent influenza vaccine is not available, and
- if immunization against H1N1 is still needed (e.g. in persons at risk of the complications of infection).

GACVS acknowledged also that the benefit-risk balance of Pandemrix remains positive where H1N1 influenza is prevalent.

The WG was informed that there is limited regulatory guidance available on the evaluation of vaccines in pregnancy leads to restrictive package labels and inserts, and countries may have differing advice on maternal immunization.

6. Seasonal Influenza Vaccine for Infants and Children

Data from a systematic review with complimented additional analysis (in publication) on disease burden in children under five years of age was presented. This age group is characterized by high influenza disease burden. The evidence on children and infants is scarce in LMIC.

An overall review on VE studies in children was presented. Information from trivalent killed influenza vaccine (TIV) and live attenuated influenza vaccine (LAIV) RCTs concluded that influenza vaccines are effective. Limited data exist on the effectiveness of TIV only in children 2 years or below (LAIV not used). Assessment on disease burden and vaccine effectiveness in this age group need to be discussed further.

Preliminary data were presented on disease burden for children ≤ 6 months from a hospital-based study in Hong Kong which showed significant disease burden for hospitalization for this group.

Summary of discussion

The WG acknowledged that there are differences in VE results in children older than 6 months and less than 2 years for different vaccines and infection risk could be higher with older children. It is also important to understand correlates of protection and immunogenicity in the very young. The commonly used correlate based on anti-HA do not account for the priming and boosting response to vaccine in young children who are immunologically naive to influenza virus antigens.

For Recommendations:

- Recommendations for children should be stratified according to age groups, starting from six months of age upwards. For infants <6 moths of age, maternal immunization should provide protection.
- More VE studies and epidemiological data are required, particularly in developing countries. However recommendations can be made on the basis of existing data with appropriate extrapolation from those obtained for risk groups in high income countries.

7. Seasonal Influenza Vaccine for Pregnant Women

Review of available disease burden data showed that pregnant women are at risk of severe disease and hospitalization as well as death. Risk of severe disease for pregnant women is also noted in the recent H1N1 pandemic. Increased severity was reported during the third trimester, particularly for those with pre-existing medical conditions. New-borne infants are protected from symptomatic influenza A virus infection by maternal antibody.

TIV is confirmed as the main type of influenza vaccine recommended and practiced in this group. Limited efficacy data exist on adjuvanted vaccines from the recent experience with pandemic H1N1(2009) vaccine. LAIV is not used in pregnancy. Assessment of pandemic H1N1 influenza vaccine in pregnancy confirmed overall safety profile.

Summary of discussion

The WG noted that even though the data on disease burden and benefit of vaccination for mothers and infants and overall VE are adequate, there is still inadequate understanding of the duration of vaccine protection for infant or long term impact of VE on the newborn.

The WG group recognized maternal influenza vaccination is operationally feasible and could be associated with good cost-effectiveness assessment with protection for the mothers and infants. At the same time, decision should be made on vaccine formulation (northern or southern) for off seasons use in pregnancy as it is raised by industry relating to timely supply.

For Recommendations:

- The use of TIV, LAIV or adjuvanted vaccines in pregnant women should be evaluated for different scenarios. For pregnant women, only TIV for non-pandemic times although if available, an adjuvanted vaccine would be a suitable alternative. In pandemic times, recommendation should include any available vaccines including LAIV.
- More safety data are required for other vaccine types (LAIV, adjavented vaccines)
- Prioritization of impact on various target groups (benefit in pregnant women in LMIC is expected to be higher than in other groups) should be reviewed

8. Seasonal Influenza Vaccine for Health Care Workers (HCW)

A systematic review on seasonal VE for HCW showed limited low quality evidence for direct VE for HCW and VE for protection of patients under care. However almost all studies examined concluded a uniform direction of potential protective effect for patients. VE for HCW is expected to be similar to those of health adults.

Seasonal influenza vaccine immunization is recommended for HCW, however uptake of vaccines in this groups is very low. Studies revealed widespread uncertainty about the rationale and lack

of basic knowledge about influenza vaccination. Institutes with mandatory seasonal influenza vaccine policy reported very high compliance rates (near 95%).

Summary of discussion

The WG noted that some data can be extrapolated from healthy adults-related studies to HCW. The WG agreed that although in general mandatory vaccination helps achieving high levels of coverage, recommendations should consider experiences from other vaccines such as rubella.

For Recommendations:

- Direct protection: protection of staff to reduce absenteeism and maintain surge capacity as part of epidemic planning policy
- Indirect protection: vaccination of HCW can limit nosocomial infections in patients
- Can be regarded as healthy adult workers when considering vaccine performance parameters such as VE etc.
- Mandatory policy has worked for increasing vaccine implementation to over 90%. WHO should only recommend when sufficient evidence is available. Optional approach by other institutes includes the request for decline statement in refusal cases.
- Develop methods to improve uptake among HCW with regard to all types of vaccines
- Research: assess impact of high vaccination coverage in HCW should be pursued
- Criteria for prioritization - resources allocation vs. different risk groups should be considered.

9. Seasonal Influenza Vaccine for the Elderly

Review of available data concluded that elderly are at high risk of contracting influenza infections and with severe outcomes. There are insufficient data on disease burden in the elderly, especially in LMIC. VE varies among studies in nursing homes or in community dwellings. In general, studies in nursing homes showed VE against influenza-related death between 27 - 70% and severe clinical illness at 20 - 50%. Herd immunity is an important confounding factor than considering the effects of chronic medical conditions alone if high coverage rate is achieved.

Comparison of high-dose vs standard-dose influenza vaccine shows significantly higher antibody responses to influenza A vaccine strains vs. standard-dose TIV vaccine for people ≥65 years of age with or without underlying medical conditions. Clinical effectiveness, safety and virological outcomes from wider application (other than USA) remain to be assessed.

Summary of discussion

The WG concluded that although vaccine works both for the prevention of lower respiratory infection and mortality for the elderly, yet may not be apparent for many countries as many reviews (including Cochrane reviews) report low vaccine effectiveness in this age group. At the same time, public health officials may overestimate the expected benefits.

For Recommendations:

- As there are no comparable data available in LMIC, results from the HIC can be extrapolated to LMIC; study data from indigenous populations with reduced medical care can be used to bridge knowledge gaps
- SAGE should encourage countries to collect data on disease burden, VE and CE in the elderly to inform decisions to establish prioritization of vaccination of risk groups for countries.
- Research on high dose vaccines for the elderly should be followed and information to be collated for further consideration.

10. Seasonal Influenza Vaccine for Other High Risk Groups

Chronic medical conditions:

The WG acknowledged that VE data are limited for patients with chronic medical conditions but supports the following conclusion:

- Possibly lower VE among persons with some high-risk conditions
- Limited studies demonstrated comparable VE in high risk persons with healthy populations

Immunosuppression:

The WG considered two main groups of immunosupressed patients and include HIV infection and transplant patients. Information demonstrated HIV positive patients may have lowered response to seasonal influenza vaccines and possibly reduced VE in patients with low CD4 counts. Immune response to vaccine was better in normal CD4 counts.

For transplant patients, expected low VE among persons with bone marrow transplants and other transplant patients who are immunocompromised. VE varies by different organ transplanted.

Summary of discussion

The WG concluded that influenza vaccines work relatively well in this group. There are sufficient data available on relative risk of sever outcomes in adults with underlying diseases, compared to those without, and children. It was noted that immunization could be a good preventive measure as compare to antiviral treatment to which this group may not respond well. Obesity is considered as a risk factor in the non-pandemic vaccine recommendation.

For Recommendations:

- it is important to differentiate VE for the types of vaccine in this group
- it is necessary to define better for different high-risk groups: high-risk but not immunosupppressed; degree of immunosuppression, HIV positive patients can be regarded as a separate category of high risk group
- recommendation should consider for regions/countries where there is no routine influenza vaccine immunization for high risk groups such as Africa, special procurement of vaccines could be a financial and logistic hurdle
- need to grade evidence on effectiveness of vaccines for the different risk groups

11. Pandemic Influenza Preparedness (PIP) Framework items relating to influenza vaccine

The PIP Framework had been adopted by the World Health Assembly in 2011. The framework, which is limited to influenza viruses with pandemic potential, provides a structured approach to share viruses and provide equity of access to benefits (notably vaccines) derived from them.

Summary of discussion

The WG acknowledged that through the PIP Framework, Member States collectively agree on the need for structured and predictable system to access pandemic vaccines.

12. Review of information and discuss strategies in relation with H5N1 stockpile and the use of pandemic vaccines

During the last WG meeting in February, 2011, the WG considered three options in reference to the WHO H5N1 pre-pandemic stockpile and suggested that the virtual stockpile option with a small physical stockpile of filled doses of H5N1 vaccine for outbreak control would provide flexibility, minimum costs and simplify the logistics of storage. In the current meeting, the WG was further informed on the pledges made by the two manufacturers and their agreement to reconvert pledged pandemic vaccine into H5N1 or other vaccine, if needed.

Summary of discussion

The WG is currently tasked by SAGE to provide further information and options for the currently committed H5N1 stockpile while discussion of the future second stockpile is ongoing with the WHO PIP Framework.

For Recommendations:

- no recommendation can be made at this stage as options for stockpiling is a revolving discussion in the PIP Framework and more information is needed from manufacturers
- future recommendations, if a physical stockpile is envisaged, should also consider criteria for deployment

13. Outcome of the 2nd Global Action Plan for Influenza Vaccines (GAP-II) consultation

In May 2006, WHO organized a consultation to develop a **Global Action Plan (GAP)** that laid out strategies for the manufacture of enough pandemic vaccine to immunize the world's population through three major approaches:

- Increase in seasonal vaccine use
- Increase in production capacity
- Further research and development

On 12–14 July 2011 in Geneva, WHO and partners organized a second GAP consultation to assess the impact and success of GAP since 2006 and develop future actions for the way forward for vaccines and influenza pandemic preparedness.

Summary of discussion

Considerable progress had been made since 2006 consultation which included activities supporting the three major approaches. Details on the progress of GAP and outcome of the 2011 consultation are available from the web site: http://www.who.int/influenza_vaccines_plan/en/

For Recommendations:

- need for evidence-based assessment for demand and capacities for countries
- recommendations should be "affordable" for countries
- recommendation should ensure the best use of resources in the LIC

14. Research Agenda for Influenza Vaccine - Update on WHO Public Health Research Agenda for Influenza: vaccine research

WHO convened the first global consultation on a *Public Health Research Agenda for Influenza* (RA) from 17 to 20 November 2009. Framework for the RA is based on public health needs. http://www.who.int/influenza/resources/research/en/index.html

Influenza vaccine is addressed in research stream 3: minimizing the impact of seasonal and pandemic influenza and the areas on focus include:

- Assessment of disease burden
- Pharmacological interventions to reduce impact of disease
- Public health policies to reduce impact of disease

Further progress of the research agenda is ongoing with specific targeted activities to monitor progress of research in the specific and highlighted areas.

Summary of discussion

The WG acknowledged the extensive coverage of influenza research topics in the RA and WG can serve as one avenue to inform the RA. One area that may need further development is on vaccine communication and risk communication issues. The WG also stressed the importance of evidence-based recommendations and the RA would be an important tool.

15. Additional discussion topics:

Topic 1. The need for revaccination in years in which the vaccine strains have not changed from the previous year

Summary of discussion

- the occurrence of vaccine strains unchanged from previous year had been rare
- annual vaccination is recommended for all high risk groups
- some studies demonstrated lower immune response in some high risk groups and revaccination would likely provide enhancement of immune response
- dependent on duration of protection and the measurement on correlates of protection
- in healthy adult groups, serological follow up 1 year after vaccination showed that immunity (measured by HI titre >= 40) is lasting over one year
- product and age group specific (LAIV vs. TIV, adults vs. children, elderly)
- recommendation for revaccination, if issued, is gradable and evidence need to be gathered

For Recommendations:

- annual vaccination (or re-vaccination if no change in vaccine strains) needs to be addressed in the recommendation
- Duration and correlates of protection should be considered
- if insufficient evidence is available, recommendations may need to be on operational issues

Topic 2. Quadrivalent formulation of seasonal influenza vaccine (QIV)

Summary of discussion

Currently vaccine strains recommendation comes from the WHO Global Influenza Surveillance and Response System (GISRS). The group had made a recommendation for three vaccine strains and recommended to have further research on the fourth strain.

For Recommendations:

- QIV should be regarded as a new product and assessed against different criteria (relative cost-effectiveness, efficacy, affordability in comparison with current products)
- Issue of vaccine effectiveness for QIV since subtype B may be lower in terms of efficacy
- Should be addressed in Future Vaccines section
- Information on the co-circulation of influenza B strains would be needed

Topic 3. Information on MF-59 adjuvanted vaccine provided

Summary of discussion

The WG acknowledged the information provided on MF-59 adjuvanted seasonal influenza vaccine and the vaccine appears to be effective in children. Additional information on the duration of immunity and efficacy in other populations will be needed in addition to the time required for the vaccine to be licensed.

Topic 4. Immunological effect of repeated TIV immunization particularly in children

Summary of discussion

There are relatively robust data from healthy adults but the immunological response in children is different. This topic should be included as area for further research.

16. Summary of overall discussion and action points

- Updating the position paper on influenza vaccine
  - A background paper outlining evidence to support recommendations for updating the position paper for influenza vaccine to be available for circulation prior to the April 2012 SAGE meeting
  - Input from WG members will be provided for each risk groups as listed in the conceptual matrix in the form of an outline of important discussion points followed with list of references to support the discussions
  - WHO secretariat will identify a writer for the background paper using the outlines provided by WG members
  - Grading of available evidence to support recommendations will be performed separately
- The WG concluded that there are now sufficient improvement on the availability of disease burden data for the different risk group to support recommendations
- There are still information gaps on surveillance and vaccine effectiveness for
  - infants less than 2 years old
  - the elderly
  - indirect protective effect for patients after vaccinating HCWs
  - information from LMIC
- Information on virus (type A and B including subtypes) epidemiology and vaccine strain selection match should be provided in the background paper particularly to support general discussions on virus epidemiology, vaccine effectiveness, annual vaccination recommendation and quadrivalent formulation

- Vaccine performance will need to be assessed for the different types of vaccines
  - TIV and LAIV in the elderly
  - TIV and LAIV in children
  - TIV and adjuvanted vaccine in children
  - TIV and LAIV in HCWs (as subgroup in healthy adults)
- Vaccine impact measures such as absenteeism is important particularly in health working adults in the context of HCWs
- Selection on types of vaccines for recommendation if considered should include evaluation for differences in safety (TIV, LAIV and adjuvanted vaccines) and such recommendation is a gradable assessment
- Vaccine performance information for the different risk groups is also a gradable assessment
- The question on whether the position paper should present prioritization of recommendations for vaccine target groups will need to be discussed and a separate teleconference should be organized to address this.
- Establishing guidelines on criteria to be considered in prioritization can be helpful
- In view of the differences in influenza disease burden and health economic situations among countries, a strict prioritization of recommendations for influenza vaccine usage may preclude countries to establish their influenza vaccine policy for the various risk groups.
- It may be feasible for the WG to provide strong recommendation to some groups (such as HCWs, pregnant women etc.) and provide information on the value and potential challenges of immunizing the targeted populations and some of the limits on vaccine effectiveness or impact to support usage in the other risk groups.
- Information on the global/country estimates on the size of the risk groups would be helpful for countries to develop their own vaccination policies and can inform decision makers on targeted coverage. Whether such data exist should be investigated.

Appendix 1. Meeting Agenda

WORLD HEALTH ORGANIZATION

3rd MEETING OF THE SAGE WORKING GROUP ON INFLUENZA VACCINES AND IMMUNIZATION
31 August to 1 September 2011
WHO Geneva - HQ - room M-105

F I N A L A G E N D A

Day 1, Wednesday 31 August 2011, Room M-105

Chair: Liz Miller
Rapporteur: Natasha Shapovalova

09:00 - 09:10	**Welcome and opening remarks** (tasks to be accomplished)	*Chair*
09:10 - 09:30	Review of previous meeting, action items and needed reports/statements for SAGE	*John Tam*
09:30 - 09:50	Outcomes of April 2011 SAGE meeting on influenza vaccines	*Philippe Duclos*
09:50 - 10:10	Vaccine effectiveness in high income countries	*Joe Bresee*
10:10 - 10:30	Vaccine effectiveness in mid- and low- income countries	*Janna Klein Breteler*
10:30 - 10:50	Vaccine economic evaluation (cost-effectiveness, cost-utility, cost benefit) in mid- and low- income countries	*Janna Klein Breteler*
10:50 - 11:10	***Refreshment Break***	
	<u>*Seasonal Influenza Vaccine for Infants and Children*</u>	
11:10 - 11:30	Influenza vaccine for infants and children: disease burden	*Anthony Mounts*
11:30 - 12:30	Discussion on seasonal vaccine for infants and children	*Led: Chair*
12:30 - 13:30	***Lunch Break***	
	<u>*Seasonal Influenza Vaccine for Pregnant Women*</u>	
13:30 - 13:50	Evidence for vaccination for pregnant woman - disease burden	*Anthony Mounts*
13:50 - 14:10	Evidence for vaccination for pregnant woman - efficacy and effectiveness including mother and infant <6 moths old	*Janet Englund*
14:10 - 15:10	Discussion on seasonal vaccine for pregnant women	*Led: Chair*
15:10 - 15:30	***Refreshment Break***	
	<u>*Seasonal Influenza Vaccine for Health Care Workers*</u>	
15:30 - 15:50	Influenza vaccine for health-care workers: systematic review	*Charles Penn*

	on effectiveness for the protection of patients	
15:50 - 16:10	Influenza vaccine for health-care workers: attitudes, predictors and interventions to increase influenza vaccination	*Helge Hollmeyer*
16:10 - 17:10	Discussion on seasonal vaccine for health-care workers	*Led: Chair*
17:10 - 17:20	Summary of day 1 activities	*Rapporteur*
17:30 - 19:30	***Cocktail***	

Day 2, Thursday, 1 September 2011, Room M-105

08:30 - 08:50	Outcome of WHA64 on the PIP Framework (OEWG) on items relating to influenza vaccine	*Anne Huvos*
08:50 - 09:10	Outcome of the 2nd Global Action Plan for Influenza Vaccine (GAP-II) consultation	*John Tam*
09:10 - 09:30	Review of seasonal and pandemic vaccines safety	*Philipp Lambach*
	Seasonal Influenza Vaccine for the Elderly	
09:30 - 10:30	Discussion on seasonal vaccine for the elderly	*Led: Chair*
10:30 - 11:00	***Refreshment Break***	
	Seasonal Influenza Vaccine for Other High Risk Groups	
11:00 - 12:00	Discussion on seasonal vaccine for other high risk groups	*Led: Chair*
	Research Agenda for Influenza Vaccine	
12:00 - 12:20	Update on WHO Public Health Research Agenda for Influenza: vaccine research	*Sylvie Briand*
12:20 - 13:20	***Lunch Break***	
13:20 - 14:50	Review the information and discuss strategy in relation with H5N1 stockpile and the use of pandemic vaccines	*Marie-Paule Kieny and Chair*
14:50 - 15:30	Additional discussions: 1. Recommendation: the need for revaccination in years in which the vaccine strains have not changed from the previous year 2. Quadrivalent formulation of seasonal influenza vaccine 3. Information on MF-59 adjuvanted vaccine provided	*Led: Chair*
15:30 - 16:30	Discussions on Summary report to SAGE November meeting	*Led: Chair*
16:30 - 17:00	Summary of action points and closure	*Chair*

Appendix 2. List of Participants

World Health Organization

INITIATIVE FOR VACCINE RESEARCH (IVR)
3rd MEETING OF THE SAGE W/G ON INFLUENZA VACCINES AND IMMUNIZATION

WHO HQ Geneva - room M-105
31 August to 1 September 2011

LIST OF PARTICIPANTS

Professor Jon S. Abramson, Chair, Department of Pediatrics, **Wake Forest University Baptist Medical Centre**, Winston-Salem, 27157 NC, **USA**

Dr William Kwabena Ampofo, Senior Research Fellow - Virology, Focal Point - National Influenza Centre and HIV Genotyping Gp, Head - Electron Microscopy / Histopathology, **Noguchi Memorial Institute for Medical Research**, Legon, Accra, **Ghana**

Dr Joseph S. Bresee, Commissioned Corps (Medical OFC), Mailstop A34, **Centers of Disease Control**, Atlanta, 30333 GA, **USA**

Professor Janet Englund, Professor at University of Washington, Infectious Disease Program, **University of Washington**, Seattle, WA 98105, **USA**

Professor Randeep Guleria, Professor and Head, Department of Pulmonary Medicine and Sleep disorders, **All India Institute of Medical Sciences**, New Delhi 110029, **India**

Professor Elizabeth Miller, Head, Immunisation Department, **Health Protection Agency, Centre for Infections**, London, NW9 5EQ **UK**

Dr Michael Pfleiderer, Head of section Viral Vaccines, **Paul-Ehrlich-Institut**, Langen, 63225 **Germany**

Professor Arthur Lawrence Reingold, Head, Division of Epidemiology, School of Public Health, **University of California**, Berkeley, CA, 94720 **USA**

Apoligies: Prof David Salisbury, Director of Immunisation, **Department of Health**, London SE18UG **UK**

Professor Barry D. Schoub, Executive Director, and Professor of Virology & Communicable Diseases Surveillance, University of the Witwatersrand, **National Institute for Communicable Diseases**, Sandringham 2131, **South Africa**

Professor Claire-Anne Siegrist, Head, WHO Collaborating Centre for Neonatal Vaccinology, Department of Pediatrics & Pathology-Immunology, **Centre Médical Universitaire**, 1211 Genève 4, **Switzerland**

Apoligies: Dr Hongjie Yu, Deputy Director, Office for Disease Control and Emergency Response, **Chinese Center for Disease Control and Prevention**, Beijing 102206, **People's Republic of China**

WHO regions

Ms Alba Maria Ropero Alvarez, Advisor on Immunization, Comprehensive Family Immunization, Area of Family and Community Health, **Pan American Health Organization**, Washington, 20037-2895 D.C., **USA**

WHO secretariat

Ms Janna Breteler, WHO Intern, HQ/IMR Implementation Research, IVR, Family, Women's and Children's Health (FWC), WHO HQ, Geneva, **Switzerland**

Dr Sylvie Briand, Medical Officer, HQ/DAC Disease Monitoring, Assessment and Control, GIP, Health Security and Environment (HSE), **WHO HQ**, Geneva, **Switzerland**

Dr Philippe Duclos, Senior Health Adviser, HQ/IVB, Immunization, Vaccines & Biologicals, Family, Women's and Children's Health (FWC), **WHO HQ**, Geneva, **Switzerland**

Dr Joachim Hombach, Acting Head, HQ/IVR Initiative for Vaccine Research, Family, Women's and Children's Health (FWC), **WHO HQ**, Geneva, **Switzerland**

Mrs Anne Huvos, Legal Officer, HQ/HEA/HSE/ADGO Office of the Assistant DG, Health Security and Environment (HSE), **WHO HQ**, Geneva, **Switzerland**

Dr Helge Hollmeyer, Medical Officer, HSE/IHR/RPI Regulations Procedures and Information

Dr Marie-Paule Kieny, Assistant Director-General, HQ/IEA/IER Innovation, Information, Evidence and Research (IER), **WHO HQ**, Geneva, **Switzerland**

Dr Philipp Lambach, Medical Officer, HQ/QSS Quality, Safety and Standards, IVB, Family, Women's and Children's Health (FWC), **WHO HQ**, Geneva, **Switzerland**

Dr Anthony Mounts, Medical Officer, HQ/DAC Disease Monitoring, Assessment and Control, GIP, Health Security and Environment (HSE), **WHO HQ**, Geneva, **Switzerland**

Dr Charles Penn, Scientist, HQ/DAC Disease Monitoring, Assessment and Control, GIP, Health Security and Environment (HSE), **WHO HQ**, Geneva, **Switzerland**

Dr Natasha Shapovalova, Technical Officer, HQ/IMR Implementation Research, IVB, Family, Women's and Children's Health (FWC), **WHO HQ**, Geneva, **Switzerland**

Dr Nahoko Shindo, Medical Officer, HSE/DAC Disease Monitoring, Assessment and Control, GIP, Health Security and Environment (HSE), **WHO HQ**, Geneva, **Switzerland**

Dr John S. Tam, Technical Officer, HQ/IMR Implementation Research, IVB, Family, Women's and Children's Health (FWC), **WHO HQ**, Geneva, **Switzerland**